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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/583,748	05/31/2000	Kouichiro Kitagawa	43888-071	4145

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EXAMINER

RIDLEY, BASIA ANNA

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/583,748

Applicant(s)

KITAGAWA ET AL.

Examiner

Basia Ridley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-10 is/are pending in the application.
- 4a) Of the above claim(s) 7-10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claim(s) 1-2, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagano (JP 11-79702) in view of Kurashige et al. (USP 5,075,268).

Regarding claim 1, Nagano discloses a fuel reforming apparatus comprising:

- reforming unit (1) including a steam reforming catalyst (11);
- a heater [0036] for heating said reforming unit (1);
- a control unit (3) for controlling the supply of raw material (20) to said reforming catalyst (11) on the basis of the temperature of the reforming catalyst (11) and for controlling the supply of an inert gas or water vapor to said reforming catalyst ([0037]-[0039] and [0051]-[0555]);
- wherein when said reforming catalyst (11) reaches a predetermined temperature said control unit (3) operates to stop said supply of said raw material (20) to said reforming catalyst (11) and to allow said inert gas or water vapor to be supplied to said reforming catalyst ([0037]-[0555]).

The reference does not explicitly disclose said reforming unit being heated while said inert gas or water is supplied to said reforming catalyst.

Kurashige et al. teaches an advantageous method of regenerating copper containing catalysts used in methanol steam reforming (abstract) wherein an inert gas or water vapor are supplied to said reforming catalyst while said reforming catalyst is being

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heated (C3/L65-C4/L11 and Table 3). Disclosed regeneration method substantially prolongs catalyst life by restoring substantially the same activity as its activity at the beginning of its use and by maintaining its crush strength (C2/L1-63).

It would have been obvious to one having ordinary skill in the art at the time of the invention to replace the two step regeneration process of Nagano with one step regeneration by supplying an inert gas or water vapor to said reforming catalyst while said reforming catalyst is being heated, as taught by Kurashige et al. for the purpose of improving catalyst longevity by restoring substantially the same activity as its activity at the beginning of its use and by maintaining its crush strength.

Regarding claim 2, Nagano in view of Kurashige et al. disclose all of the claim limitations as set forth above. Additionally while the references do not explicitly disclose a recovering gas supply unit for supplying an inert gas or water vapor to said reforming unit, a presence of said supply unit is inherent in the apparatus of Nagano in view of Kurashige et al.

Regarding claim 4, Nagano in view of Kurashige et al. disclose all of the claim limitations as set forth above. Additionally Nagano discloses the apparatus further comprising:

- a sensor for detecting a concentration of hydrogen gas, wherein activity of said reforming catalyst is recovered when a concentration of hydrogen gas is below a predetermined concentration ([0016]).

Regarding claim 6, Nagano in view of Kurashige et al. disclose all of the claim limitations as set forth above. Additionally Kurashige et al. discloses the apparatus wherein:

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- said reforming catalyst is heated at a temperature in the range of 500 to 800°C (Table 3).

Regarding limitations recited in claims 1-2, 4 and 6 which are directed to a manner of operating disclosed apparatus, the examiner notes that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, the examiner notes that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

3. Claim(s) 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagano (JP 11-79702) in view of Kurashige et al. (USP 5,075,268), as applied to claim 1 above, and further in view of Okada et al. (USP 5,302,470).

Regarding claim 5, Nagano in view of Kurashige et al. disclose all of the claim limitations as set forth above, but the references do not explicitly disclose said apparatus comprising a desulfurizer for removing a sulfide from raw materials.

Okada et al. teaches that it is desirable to remove even trace amounts of sulfur from the reformer feedstock for the purpose of extending life of the reforming catalyst (C1-C4).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a desulfurizer for removing a sulfide from raw materials in the reformer of Nagano, as taught by Okada et al., for the purpose of improving system

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economics by allowing processing of various raw materials, even ones which include sulfur, and by increasing the time between required catalyst regenerations.

Regarding limitations recited in claim 5 which are directed to a manner of operating disclosed apparatus, the examiner notes that neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, the examiner notes that process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

#### ***Response to Arguments***

5. Applicant's arguments filed 30 November 2004 have been fully considered but they are not persuasive.

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6. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., deterioration of the reactivity of reforming catalyst due to sulfur component) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Further, the examiner notes that recitation "a reforming unit (...) for steam reforming a hydrocarbon containing sulfur compounds" does not constitute a positive limitation in an apparatus claim. A recitation of recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 370 F.2d 576, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 312 F.2d 937, 939, 136 USPQ 458, 459 (CCPA 1963). Further, it is well settled that the intended use of a claimed structure or apparatus does not serve to distinguish the claimed device over the prior art. *In re Yanush*, 477 F.2d 958, 989, 177 USPQ 705, 706 (CCPA 1973); and *In re Casey*, 370 F.2d 576, 580, 152 USPQ 235, 238 (CCPA 1967). The applicant has not explained, and it is not apparent to the examiner, how the apparatus of Nagano in view of Kurashige et al. is incapable of steam reforming hydrocarbons containing sulfur compounds.

7. In response to applicant's argument that Nagano does not disclose that supply of inert gas contributes to recovery of catalyst activity, the examiner notes that the fact that

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applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In this case Nagano clearly discloses a control unit (3) for controlling the supply of raw material (20) to said reforming catalyst (11) on the basis of the temperature of the reforming catalyst (11) and for controlling the supply of an inert gas or water vapor to said reforming catalyst ([0037]-[0039] and [0051]-[0055]); wherein when said reforming catalyst (11) reaches a predetermined temperature said control unit (3) operates to stop said supply of said raw material (20) to said reforming catalyst (11) and to allow said inert gas or water vapor to be supplied to said reforming catalyst ([0037]-[0055]), as set forth above.

The applicant argues that the examiner has not explained why an ordinary artisan would combine references of Nagano in view of Kurashige et al. to arrive at instant invention, as Nagano is directed to methanol-reforming approach while Kurashige et al. is directed to method for regeneration of methanol reforming catalyst. This is not found persuasive. The examiner would like to point out that contrary to applicant's arguments, both references are directed to method for regeneration of methanol reforming catalyst comprising copper when reactor temperature indicates high degree of catalyst degradation, see Nagano ([0021]-[0022] and [0051]-[0055]) and Kurashige et al. (abstract and C3/L65-C4/L11 and Table 3). Since the catalyst regeneration method disclosed by Nagano comprises two steps (feeding of inert gas and feeding of oxygen containing gas, see [0051]-[0055]), it would have been obvious to one having ordinary skill in the art at the time of the invention to replace said process of Nagano with one step



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regeneration by supplying an inert gas or water vapor to said reforming catalyst while said reforming catalyst is being heated, as taught by Kurashige et al. for the purpose of improving catalyst longevity by restoring substantially the same activity as its activity at the beginning of its use and by maintaining its crush strength. In this regard, one of ordinary skill in the art would have expected that the elimination of oxygen supplying step would avoid costs associated with said step. *In re Thompson*, 545 F.2d 1290, 1294, 192 USPQ 275, 277 (CCPA 1976); *In re Clinton*, 527 F.2d 1226, 1229, 188 USPQ 365, 367 (CCPA 1976).

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

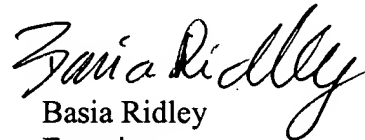
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (571) 272-1453.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (571) 272-1444.

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The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Technical Center 1700 General Information Telephone No. is (571) 272-1700. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Questions on access to the Private PAIR system should be directed to the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).



Basia Ridley  
Examiner  
Art Unit 1764

BR

February 22, 2005